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ABSTRACT

Sixty-four high school students, stratified by field-dependent or independent cognitive style, were randomly assigned to homogeneous or heterogeneous groups of four to attain concepts in the sequence of complex to simple or simple to complex, with either minimal or strategy instructions. Subsequently, each student individually attained four concepts. Analysis of transfer data indicated that (1) field-independents attain concepts more efficiently than field-dependents, and that (2) strategy instructions and the complex to simple training sequence were facilitating for field-independents, but inhibiting for field-dependents. No significant main effects were found for grouping, training sequence, or instructions on the performance of subjects in groups during the training phase, using any of the three dependent variables: time required to solve each concept problem, number of alternatives selected prior to solution, and number of hypotheses to solution. Although no significant main effects were found, several interactions were significant. These findings were briefly compared to other studies. (Author/MV)

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EFFECTS AND COGNITIVE STYLE, GROUP STRUCTURE, INSTRUCTIONS, AND TRAINING SEQUENCE UPON ACQUISITION AND TRANSFER IN CONCEPT ATTAINMENT

Mary J. Rains and Dean L. Meinke

Considerable amounts of research evidence have accumulated concerning conceptual learning and cognitive style. Much of this research has been accomplished in a variety of settings in which many of the variables of concern in this study were examined individually. For example, Davis (1967) (1972), Fredrick (1968), Nelson (1972), Nebelkopf and Dreyer (1973), and Nelson and Chavis (1975) were concerned with the relationship of cognitive style and concept learning; Laughlin (1965), Laughlin, McGlynn, Anderson, and Jacobson (1968), and McGlynn and Schick (1973) were concerned with the effects of group structure upon efficiency of learning concepts. Klausmeier and Meinke (1968), Meinke and Klausmeier (1969), Hester and Tagatz (1971), and Tennyson, Steve, and Boutwell (1974) were concerned with the effects of instructions upon concept acquisition; Frederick (1965) and Meinke (1966) were concerned with the effect of the sequence of the concept problem upon concept learning; and Klausmeier, Wiersma, and Harris (1963), Fredrick (1965), Lemke and Hecht (1971), Beamer and Lemke (1973), and Lemke, Leicht, and Miller (1974) investigated the effects of prior training in groups upon transfer to the acquisition of new concepts. However, some information related to the interrelationship among these variables is unavailable because they were not investigated in a single study. If these variables were manipulated in a more complex study, where transfer effects were examined, then not only would the main effects be available for study but their interactions could be studied as well. Therefore, the purpose of this investigation was to study the main effects of interactions of cognitive style, group structure, instructions, and training sequence upon the transfer of concept learning practice to the acquisition of new concepts. Specifically, we

were interested in investigating the following questions:

1. What are the effects of the following variables upon group performance in a concept learning task: (a) homogeneous or heterogeneous grouping based upon cognitive style, i.e. field dependent or field independent subjects; (b) sequence of concept problems from simple to complex or from complex to simple, i.e. 2, 3, 4, 5 attribute problems or 5, 4, 3, 2 attribute problems; and (c) instructions, minimal or strategy?

2. What are the main and interactive effects of the following variables upon performance of individuals on a concept learning task after prior training in homogeneous or heterogeneous groups: (a) cognitive style, field independent versus field dependent subjects; (b) group structure, prior training in homogeneous or heterogeneous groups; (c) sequence of concept problems in training, 2, 3, 4, 5 attribute problems or 5, 4, 3, 2 attribute problems; or instructions during training, minimal or strategy?

METHOD

SUBJECTS

The subjects for this study were high school students who were attending summer school in a suburban area. Some students were enrolled in remedial or accellerated classes, but the majority of the students were attending physical education and drivers education classes. Thus, a wide range of ability levels were represented. From a pool of 268 high school students, 64 students were selected for the experiment. 32 students were selected randomly from those students who scored at least one standard deviation above the mean on part A of the Hidden Figures Test (HFT). 32 students were selected randomly from those students who scored at least one standard deviation below the mean on the same test. The first group was classified as Field-Independent (F-I) students and scored 8.75 or higher on part A of the HFT while the second group was classified as Field-Dependent (F-D) students and scored .25 or lower on part A of the HFT. Both groups had 15 male subjects and 17 female subjects.

Their ages ranged from 14 years 8 months to 17 years 6 months with a mean age of 15 years 11 months.

EXPERIMENTAL MATERIAL

A stimulus display board of 64 cards arranged in 8 rows with 8 cards in each row was used. Each stimulus card had 6 dichotomous attributes with one value for each of the 6 attributes represented on each card. The 6 attributes and their values were: border number, one or two; border type, solid or broken; figure number, one or two; figure size, large or small; figure shape, circle or square; and figure color, red or green.

Four concept training problems were selected at random from all possible 2, 3, 4, 5 attribute conjunctive concept problems with the restriction of one problem from each of the four problem types. The four concept problems for the transfer problems were selected at random from all possible three attribute conjunctive concept problems after excluding the three attribute problem used during training.

EXPERIMENTAL PROCEDURE

After random assignment to one of three training groups, F-I homogeneous, F-D homogeneous, or heterogeneous, subjects were given appropriate instructions according to random assignment to the minimal or strategy condition. The specific instructions were adapted from those instructions reported by Klausmeier and Meinke (1968). All subjects working together cooperatively in their respective training groups were given four concept problems in the order sequence of 2, 3, 4, 5 attribute problem or 5, 4, 3, 2 attribute problem according to assigned condition. A ten minute limit was established for each problem. If the concept problem was not solved within the time limit, subjects were given the appropriate solution. They were then given the next concept problem.

When the instructions had been read to the subjects and after there were no further questions from any of the subjects, the experimenter presented the first concept problem by specifying the focus card. The subjects' task was to select

additional cards until the correct hypothesis was given which defined the concept to be attained or until ten minutes had elasped. The experimenter provided feedback by saying "Yes" to cards which belonged to the concept, by saying "No" to cards which did not belong to the concept, and by informing subjects when their hypotheses of the concept were wrong and when they were right.

Twenty-four hours after the training session, subjects reported individually to the testing center. Each individual subject was given four three attribute concept problems for the transfer task. The same procedure was used for the transfer task as the training task. Specifically, the experimenter presented the focus card and the subject selected cards and offered hypotheses until the concept problem was attained or ten minutes elasped.

EXPERIMENTAL DESIGN

Three dependent variables were used in this study for both the training phase and for the transfer phase. They were: time-to-solution for each concept problem, number of card selections prior to solution for each concept problem, and number hypotheses to solution for each concept problem. Separate analyses of variance were performed for each dependent variable for the training phase and the transfer phase of the study.

The training phase of the study was examined by using a 3 X 2 X 2 factorial design where total scores across the four training problems for each measure were used as the dependent variable. The first factor was group structure (homogeneous F-I, homogeneous F-D, or heterogeneous), instructions (minimal or strategy), and training sequence, (5, 4, 3, 2 or 2, 3, 4, 5 attribute problems). There were eight heterogeneous groups and four homogeneous groups for field independents and field dependents, respectively. Therefore, one half of the heterogeneous groups were randomly eliminated at attain equal all size. Since the total sample size was twelve and only one group represented in each cell, the sum of squares and degrees of freedom for all interactions were pooled to form the error mean square.

The transfer phase of the study was examined using a 2 X 2 X 2 X 2 X 4 factorial design with repeated measures on the last factor. The bi-leveled factors were: cognitive style (F-I or F-D), group structure (homogeneous or heterogeneous), instructions (minimal or strategy), and training sequence (5, 4, 3, 2 attribute problem or 2, 3, 4, 5 attribute problem). The repeated measure on the last factor was ordinal position of the problem (1st, 2nd, 3rd, or 4th). Separate analyses of variance were run for each dependent measure, time-to-solution, number of cards selected to solution, and number of hypotheses offered to solution.

RESULTS

The acquisition of concepts by groups of subjects during the training phase was analyzed using a 3 X 2 X 2 ANOVA where scores were summed across all training problems for each of the three dependent variables. There were no significant main effects at the .05 level for any of the main effects on any of the dependent measures.

The acquisition of concepts by individuals during the transfer phase was analyzed using a 2 X 2 X 2 X 2 X 4 factorial design with repeated measures on the last factor. In Table 1 one can note that when time to solution was the measure, significant main effects were found for cognitive style and ordinal position of the

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Insert Table 1 about here

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concept problem, F (1, 48) = 15.96, $p < .01$ and F (3, 144) = 3.99, $p < .01$, respectively. There were two significant interaction effects at the .05 level of significance. Cognitive style interacted significantly with instructions and cognitive style, training sequence, and instructions interacted significantly.

In Table 2 one can see that significant main effects are found for cognitive style and ordinal position of the problem, F (1, 48) = 8.62, $p < .01$ and F (1, 144) = 4.79, $p < .01$, respectively where number of cards to solution was the measure. Several significant interactions were found. Group structure interacted significantly

Insert Table 2 about here

with training sequence. Cognitive style interacted significantly with instructions. There was a significant interaction effect for cognitive style, training sequence, and instructions. Also the factors of cognitive style, group structure, training sequence, and instructions interacted significantly. Several significant interactions were found with the repeated measure. Cognitive style interacted significantly with problems. Training sequence interacted significantly with problems. Instructions interacted significantly with problems. Finally, there was a significant group structure by training sequence by problem interaction.

One can see in Table 3 that a significant main effect was found for cognitive style, F (1, 48) = 9.98, $p < .01$. The significant interactions were: cognitive style by group structure by instructions and group structure by training sequence by instructions.

The means for the significant main effects of cognitive style when using all three dependent variables indicate that field independent subjects solve concept problems more efficiently than field dependent subjects, 167.25 minutes and 279.62 minutes, respectively. Field independent subjects also select fewer cards prior to concept solution than field dependent subjects, 9.94 cards and 12.21 cards, respectively. Finally field independent subjects offer fewer hypotheses than field dependent subjects, 1.98 hypotheses and 2.70 hypotheses, respectively.

The significant effects for the repeated measure using time to solution indicate that subjects take most time on the first problem and the least time on the second problem. The means for the first, second, third and fourth problems, respectively

Insert Table 3 about here

are 266.81, 195.58, 221.27, and 210.08. When the number of cards to solution is the measure, subjects selected more cards on the fourth problem and the fewest cards on the third problem. The means for the ordinal position effect are 11.89, 10.80, 9.63, and 12.16.

DISCUSSION

TRAINING PHASE

The analysis of the data for acquisition of concepts during the training phase was based upon the summation of scores across four problems on each of the dependent variables. Therefore, the findings of this part of the study are not directly comparable to the research cited earlier. Further, the failure to have replications of groups of subjects within each cell precluded the examination of the interactive effects of the main variables under investigation. Further, when looking at the acquisition of concepts across the four problems in the training phase, we noted non systematic patterns which did not appear to be congruent or consistent with the typical learning acquisition curves across problems for subjects working as individuals. Therefore, there is no way to compare these findings with the studies in concept learning where subjects attain concept problems individually. There is a need, however, to expand this part of the study so that enough subjects are used so that the learning curves of the groups can be compared with performances of individuals. Further, an expanded study would make possible an examination of the interactive effects of the independent variables. It should be noted, however, that other researchers who have investigated the effects of homogeneous and heterogeneous groupings have reported results for the individual transfer phase only. (Beane and Lemke, 1971; Piland and Lemke, 1971; and Lemke, Leicht, and Miller, 1974).

TRANSFER PHASE

None of the main effects of group structure, instructions nor training sequence reached the .05 level of statistical significance for the transfer phase. However, all three variables were involved in interactions which will subsequently be discussed.

Although group structure with the cognitive style variables has not received experimental attention, studies using other variables to stratify individuals into homogeneous and heterogeneous groups have also failed to find a significant main effect for group structure in subsequent individual transfer performance (Veane & Lemke, 1971; and Lemke, et al, 1974). The grouping variable did, however, interact with other variables in those two studies as it did in the present investigation. Similar, training sequence by itself has failed to effect differences in transfer, but has interacted with other variables (Fredrick, 1965). The two levels of instructions used in this study did result in significant differences in performance in other investigations (Klausmeier & Meinke, 1968; and Meinke & Klausmeier, 1969). The discrepancy between the results in those two studies and this one will be discussed in conjunction with the interaction of instructions with other variables.

The main effect of cognitive style was significant, and consistent with the results reported by other researchers (Davis, 1967; 1972; Fredrick, 1968; Nelson, 1972; Nelson and Chavis, 1975). F-I students demonstrated performance superior to F-D students on all three dependent variables. Davis (1967) suggested the inability of F-D students to utilize feedback or process information as two possible reasons for their difficulty in concept identification tasks. Although it was not directly tested, the experimenters noted that F-D students had difficulty utilizing information from negative feedback. For example, they did not make note of those cards that did not belong to the concept, but did make note of those that did represent the concept. Whether they can learn to process information from negative instances through perhaps more practice and/or instructions incorporating a rule is a problem for further research.

The interaction of cognitive style with other variables provides additional insight into the problem solving behavior of F-D students. Generally, the combination of other variables that resulted in the best performance by F-I students were the

conditions under which the F-D students had the most difficulty. This trend for F-I and F-D students to react differentially to other variables is readily apparent from an inspection of Figures 1 and 2, which represent the interaction of cognitive style by instructions for the dependent variables of time-to-criterion and number of card choices. The instructions used in this study were the same as two of the three levels of instructions used by Klausmeier and Meinke (1968) and Meinke and Klausmeier (1969). They found that students were more efficient with strategy than with minimum instructions on all dependent variables in the first study and reported strategy instructions superior to minimum instructions on time-to-criterion scores in the second study. However, in this study the trend on both dependent variables was that F-I students were more efficient when given the strategy rather than minimum instructions, while the opposite effect occurred for the F-D students. There was no significant difference between the performance of F-I and F-D students with minimum instructions, but a significant difference did occur in their response to the strategy instructions. Thus, it seems the discrepancy among the three studies concerning the effect of instructions is primarily due to the cognitive style factor; specifically,

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Insert Figures 1 & 2 about here

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the inclusion of the F-D students in this study. A person's level of differentiation increases during the course of normal development (Witkin, Goodenough and Karp (1967), and, thus, one would expect college students to display a higher level of differentiation than high school students. The students participating in this experiment were selected on the basis of scoring at least one standard deviation above or below the mean on the HFT. Therefore, even if the level of differentiation does not increase significantly from high school to college age, the level of differentiation represented by the F-D students in this study would probably not have been represented in any significant proportion in the samples of students participating in the studies reported by Klausmeier and Meinke (1968) and Meinke and Klausmeier (1969).

The main effect of problem was significant, as were five of the interactions involving the repeated measures. An attempt to provide a rationale for these effects is tenuous due to the confounding of ordinal position and problem difficulty. However, some hypotheses can be developed from a combination of the conclusions and generalizations based on the results of other studies, analysis of the concepts and student responses, and experimenter observations. These hypotheses will be discussed along with suggestion for further research.

The mean time required to attain successive concepts decreased, which is consistent with results reported by other researchers (Tagatz, 1967; Klausmeier & Meinke, 1968; Meinke & Klausmeier, 1969; Hester & Tagatz, 1971). However, the differences in number of card selections across problems deviates from what other researchers have usually reported. The number of card selections has generally been found to decrease significantly across the first three to five problems, and then level off (Hester & Tagatz, 1971; Klausmeier & Meinke, 1968).

The mean time-to-solution decreased significantly from the first to the second problem and remained at approximately the same level for the last two problems. In contrast, the number of card selections decreased from the first to the second and the third problem, and then increased significantly on the fourth problem. The mean number of cards selected on problem four did not differ from the mean number selected from problem one, but the mean number for problem three was significantly less than for all other problems. The time required to solve the fourth problem was less than the required time for problem one, but there was no difference in the mean number of cards selected for the first and fourth problems. This would seem to indicate that students learned how to utilize information once they found it, but had not acquired efficient search strategies for finding information.

The cognitive style by problem interaction on number of cards selected indicates that the main effect for problem was primarily due to the performance of F-D students. An inspection of the graphs for these two effects (Figure 3 and 4) reveals the performance of F-D students to be very much like the performance described for the main effect of problem, while F-I students performed consistently across problems. Since all students received the problems in the same order, no conclusions

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Insert Figures 3 & 4 about here

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can be made as to whether this is an effect of the specific problem, the effect of ordinal position, or a combination of both. However, a number of possibilities will be discussed. Other studies involving the cognitive style variable have attributed differences in response across problems to stimulus-response compatibility (Davis, 1967) and perceptual rather than conceptual responding (Fredrick, 1968), which do not appear applicable to this study. Other alternatives, such as, difficulty in breaking a learning set (Witkin, Dyk, Faterson, Goodenough, and Karp, 1962) and frustration (Campbell & Douglas, 1972) do seem applicable, especially since differences have been found between F-I and F-D students on these two variables.

Even though the F-D students decreased the time required to solve problems, their mean time to solution on those problems was 342.1, 257.1, 253.9, 265.4, as compared to 191.5, 134.1, 188.6, 154.8 for the F-I students. Thus the time factor could have inhibited their performance on problem 4. Reports from the experimenters indicated that students became frustrated if they had not solved the problem within four or five minutes. This was indicated by both verbal and nonverbal behavior. The students' concern with the time element was apparent from their questions regarding how fast they solved the problems in relation to other students; indicating that they were very much aware of the stop watch and the recording of the time required to attain the concept. They seemed to select cards rapidly, but in a random manner. It seems reasonable that frustration over the time factor could have resulted in this

type of behavior. Thus, the time limitations and awareness of being timed could be investigated to determine their effect on performance across problems.

The Instructions X Problem interaction apparently occurred because of performance differences between problems two and three (Figure 5). The mean number of cards selected by students given strategy instructions decreased through the third concept and increased on the fourth, which follows the same pattern as the results for the main effect of problem. The difference in card selections was significant between problem three and all others. However, students instructed with minimum instructions did not improve performance on the third problem. Instead, the mean number of card

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Insert Figure 5 about here

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selections started increasing after the second problem, with a significant difference between number of cards selected for problem four compared to problem two and three. Hester and Tagatz (1971) reported that the students were more efficient with commonality than conservative instructions on problem 1 and 2, but found no differences between subsequent problems due to instructions. The interaction shown in Figure 5 may indicate that students with minimum instructions were more efficient on problems 1 and 2, but students with strategy instructions were more efficient on problem 3 and 4. However, for each of the concepts there were no significant differences in card selections between students with minimum or strategy instructions. This may indicate that the statistical significance of the interaction is not very meaningful. But, then, it may also indicate possible difference in card selections across problems is due to factors such as the organization of the stimulus board or a learning set, a change in those conditions may result in more or less difference in performance as a result of instructions. Therefore, the differential effect of instructions should not be overlooked in subsequent research.

The interaction of Problem X Training Sequence seems to have occurred because of the fluctuation in number of card choices made by students trained in the 2-5 sequence (Figure 6). Students trained with the 5-2 sequence improved performance from problem one through problem three, with the mean number of cards selected for problems two and three being significantly different from problem one. Students trained with the 2-5 sequence fluctuated from problem to problem, but the only significant difference was between cards selected for problems 3 and 4. Fredrick (1965) failed to find an effect on performance resulting from the sequence of problem complexity during training. That study used only 2 training problems and 2 transfer problems, and varied complexity between 2 and 3 relevant attributes. The 5 attribute problem used in this study so limits the number of exemplars that subject's reaction to sequence effects may be very different from the effects of working with two and three relevant attributes.

Insert Figure 6 about here

In summary the findings of this study are:

1. There were no significant main effects found for grouping, training sequence, or instructions on the performance of subjects in groups during the training phase using any of the three dependent measures.
2. A consistent significant main effect for cognitive style was found on all three dependent variables where field independent subjects performed significantly better than field dependent subjects during the transfer phase of the study.
3. A significant main effect for ordinal position of the concept problems was found when using time to criterion and number of card choices to solution as dependent variables during the transfer phase of the study.
4. Several significant interactions were found which can be interpreted to help explain some of the failures to replicate findings reported in earlier studies.

Clearly, the most important implication of this study is based upon the finding of differential performance of subjects when classified as field independent or field dependent subjects. This variable concerning individual differences among subjects is especially critical when instructions are used which incorporate strategies for information finding and for information utilization.

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TABLE 1

Analysis of Variance of Time-to-Criterion Scores with Four Problems as the Repeated Measure on the Transfer Task

Source	df	MS	F	Level of Significance
Cognitive Style (F)	1	808088.5	15.9623	.01
Group (G)	1	116664.9	2.3045	
Training Sequence (C)	1	148851.3	2.9403	
Instructions (I)	1	18581.1	0.3670	
F X G	1	76210.1	1.5054	
F X C	1	9567.0	0.1890	
G X C	1	23275.3	0.0614	
F X I	1	205605.1	4.0613	.05
G X I	1	15891.7	0.3139	
C X I	1	9084.5	0.1794	
F X G X C	1	5633.9	0.1113	
F X G X I	1	17472.5	0.3451	
F X C X I	1	273071.5	5.3940	.05
G X C X I	1	13528.6	0.2672	
F X G X C X I	1	59992.5	0.2503	
Ss/ (FGCI)	48	50624.8		
Problem (P)	3	60602.1	3.9943	.01
F X P	3	20228.0	1.3332	
G X P	3	16713.2	1.1016	
C X P	3	6360.8	0.4192	
I X P	3	32558.7	2.1460	
F X G X P	3	18878.8	1.2443	
F X C X P	3	18950.5	1.2490	
G X C X P	3	30472.9	2.0085	
F X I X P	3	9315.5	0.6140	
G X I X P	3	3797.5	0.2503	
C X I X P	3	36275.0	2.3909	
F X G X C X P	3	30290.3	1.9964	
F X G X I X P	3	18473.1	1.2176	
F X C X I X P	3	10576.9	0.6971	
G X C X I X P	3	14225.3	0.9276	
F X G X C X I X P	3	21138.9	1.3933	
Ss/ (FGCIP)	144	15172.1		

TABLE 2

Analysis of Variance of Number of Card Selections for the Transfer Task with Four Problems

Source	df	MS	F	Level of Significance
Cognitive Style (F)	1	356.2656	8.6205	.01
Group (G)	1	7.5625	0.1830	
Training Sequence (C)	1	1.5625	0.0378	
Instructions (I)	1	.1562E-01	0.0004	
F X G	1	156.2500	3.7808	
F X C	1	9.0000	0.2178	
G X C	1	356.2625	8.6205	.01
F X I	1	185.6406	4.4919	.05
G X I	1	56.2500	1.3611	
C X I	1	4.0000	0.0968	
F X G X C	1	8.2656	0.2000	
F X G X I	1	132.2500	3.2000	
F X C X I	1	225.0000	5.4443	.05
G X C X I	1	3.5156	0.0851	
F X G X C X I	1	346.8906	8.3937	.01
Ss/ (FGCI)	48	41.3276		
Problem (P)	3	85.4844	4.7863	.01
F X P	3	72.5885	4.0642	.01
G X P	3	16.8229	0.9419	
C X P	3	49.1979	2.7546	.05
I X P	3	62.8177	3.5172	.05
F X G X P	3	.5729	0.0321	
F X C X P	3	9.0729	0.5080	
G X C X P	3	53.2344	2.9806	.05
F X I X P	3	16.8802	0.9451	
G X I X P	3	8.6771	0.4858	
C X I X P	3	32.7604	1.8343	
F X G X C X P	3	24.7135	1.3837	
F X G X I X P	3	8.4062	0.4707	
F X C X I X P	3	42.5312	2.3813	
G X C X I X P	3	12.1927	0.6827	
F X G X C X I X P	3	23.2933	1.3042	
Ss/ (FGCIP)	144	17.8603		

TABLE 3

Analysis of Variance of Number of Hypotheses Scores
on the Transfer Task with Four Problems

Source	df	MS	F	Level of Significance
Cognitive Style (F)	1	33.06250	9.9890	.01
Group (G)	1	5.06250	1.5295	
Training Sequence (C)	1	8.25662	2.4973	
Instructions (I)	1	1.26562	0.3824	
F X G	1	.156150E-01	0.0047	
F X C	1	2.25000	0.6798	
G X C	1	.62500E-01	0.0189	
F X I	1	7.56250	2.2848	
G X I	1	2.25000	0.6798	
C X I	1	.390625	0.1180	
F X G X C	1	1.89062	0.5712	
F X G X I	1	.15615-01	0.0047	
F X C X I	1	20.25000	6.1181	.05
G X C X I	1	16.00000	4.8340	.05
F X G X C X I	1	.390625	0.1180	
Ss/ (FGCI)	48	3.309875		
Problems (P)	3	4.21354	2.1585	
F X P	3	1.42708	0.7311	
G X P	3	2.23958	1.1473	
C X P	3	2.67188	1.3687	
I X P	3	1.46354	0.7497	
F X G X P	3	2.90104	1.4861	
F X C X P	3	2.15625	1.1046	
G X C X P	3	2.44792	1.2540	
F X I X P	3	2.13542	1.0939	
G X I X P	3	2.26042	1.1579	
C X I X P	3	4.29688	2.2012	
F X G X C X P	3	2.60938	1.3367	
F X G X I X P	3	1.23428	0.6323	
F X C X I X P	3	2.72958	1.4034	
G X C X I X P	3	4.67708	2.3959	
F X G X C X I X P	3	1.98438	1.0165	
Ss/ (FGCIP)	144	1.95210		

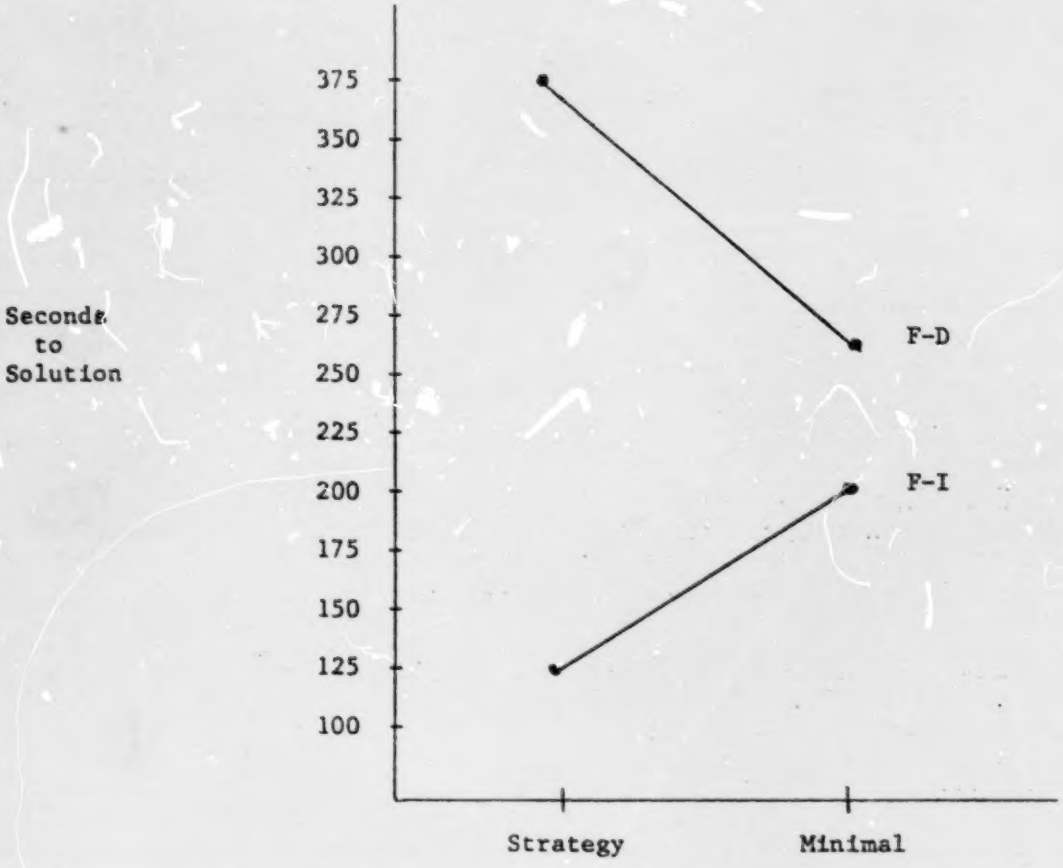

Figure 1 Means for Cognitive Style by Instructions Interaction for Dependent Variable of Time-to-Solution

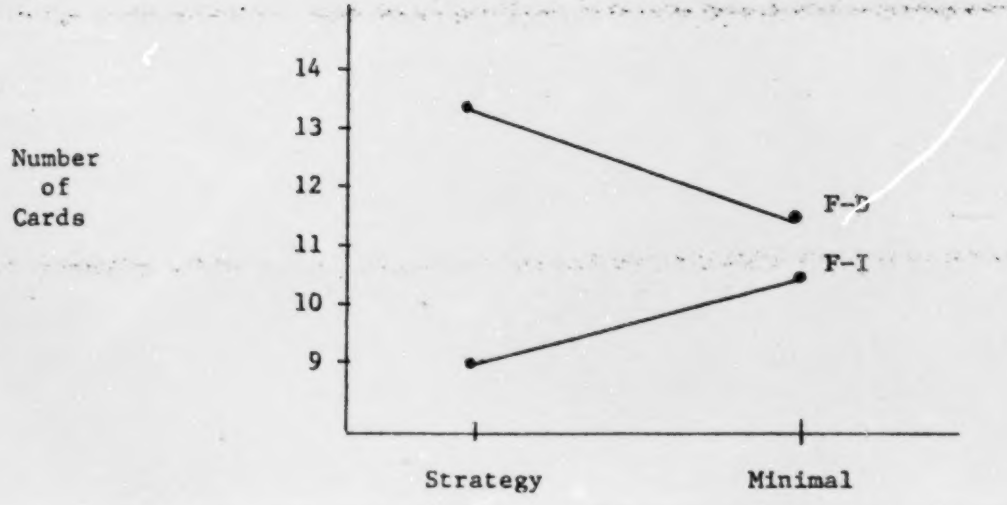

Figure 2 Mean Number of Card Selections for the Interaction of Cognitive Style by Instructions

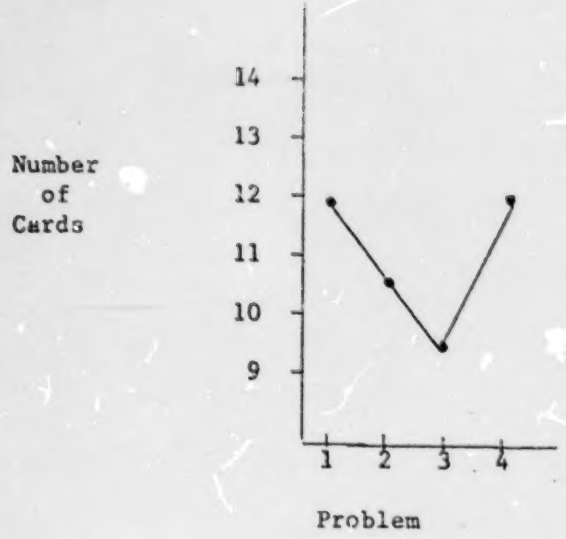

Figure 3 Mean Number of Card Selections for Each Transfer Problem

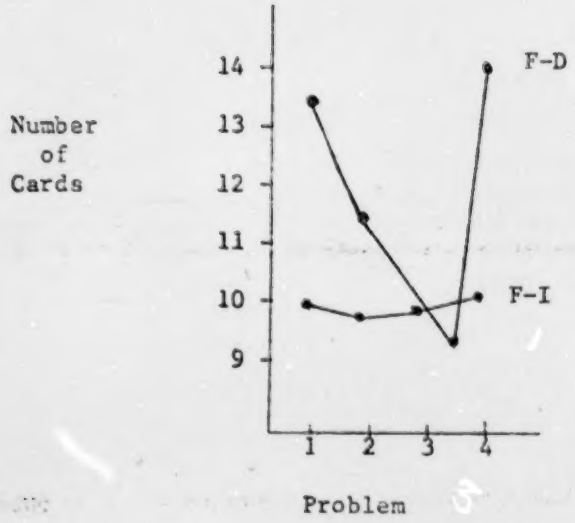

Figure 4 Mean Number of Card Selections for the Interaction of Cognitive Style by Transfer Problem

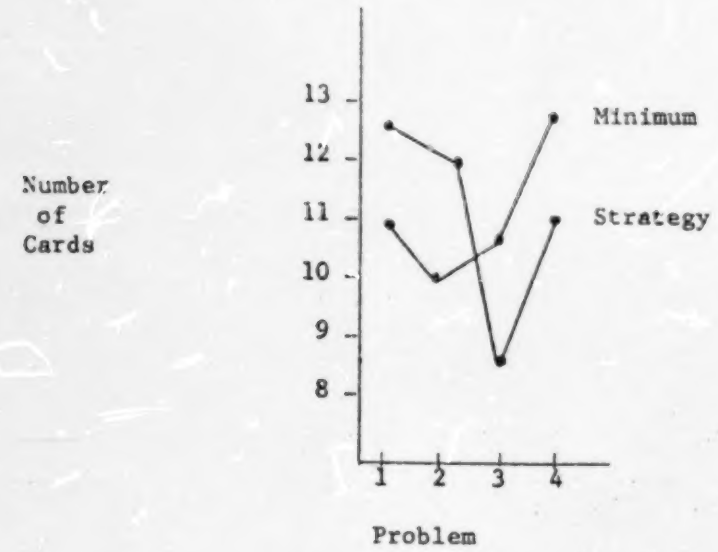

Figure 5 Mean Number of Card Selections for Interaction of Instructions by Transfer Problem

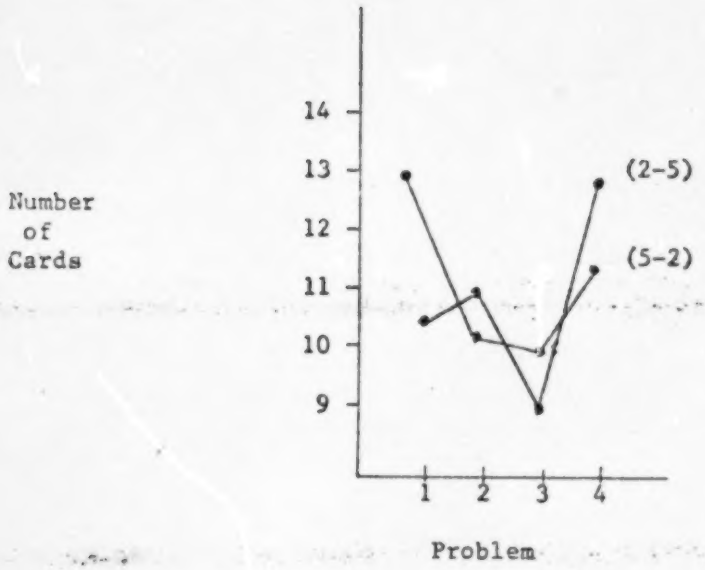

Figure 6 Mean Number of Card Selections for the Interaction of Transfer Problem by Training Sequence